

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Final Draft Socioeconomic Report For Proposed Rule 3501—Recordkeeping for Locomotive Idling and Proposed Rule 3502—Minimization of Emissions from Locomotive Idling

January 2006

Deputy Executive Officer

Planning, Rule Development and Area Sources
Elaine Chang, DrPH

Assistant Deputy Executive Officer

Planning, Rule Development and Area Sources
Laki T. Tisopulos, Ph.D., P.E.

Planning and Rules Manager

Planning, Rule Development and Area Sources
Susan Nakamura

Author: Shah Dabirian, Air Quality Specialist

Technical Assistance: Chris Abe, Air Quality Specialist
Mike Bogdanoff, Program Supervisor
Patricia Kwon, Air Quality Specialist

Reviewed By: Barbara Baird, Principal Deputy District Counsel
Mike Harris, Senior Deputy District Counsel
Frances Keeler, Senior Deputy District Counsel
Andrew Lee, P.E., Program Supervisor
Sue Lieu, Program Supervisor
Jill Whynot, Planning and Rules Manager
William Wong, Senior Deputy District Counsel

INTRODUCTION

Proposed Rule 3501 (PR 3501) establishes recordkeeping and reporting requirements for freight locomotives operating in the district. Under PR 3501 operators are required to maintain records and submit weekly and annual reports of idling events of 30 minutes or more. A locomotive can be exempt from the recordkeeping requirements if it is equipped with an anti-idling device or uses an alternative technology; or if a railroad submits an Alternative Compliance Plan for either its intra- and/or inter-district fleet of locomotives.

Proposed Rule (PR) 3502 establishes idling requirements for freight locomotives operating in the district. To minimize emissions from unnecessary idling of freight locomotives, the proposed rule identifies specific situations in which a locomotive cannot idle for more than 30 minutes. Examples of these situations are if the locomotive is unattended because a relief crew has not arrived or the crew has left for a meal break; the locomotive is queuing for fueling, maintenance or servicing; maintenance or diagnostics that is conducted on the locomotive does not require operation of the engine; or there is a delay or breakdown of a locomotive that will result in a delay of 30 minutes or more.

Under PR 3502, a railroad can submit an Emissions Equivalency Plan to demonstrate that implementation of a specified control approach will reduce from locomotives NOx and PM emissions that are the same or greater than if the locomotive were to comply with the idling requirements. If the Emissions Equivalency Plan is approved, the railroad would be exempt from idling requirements of PR 3502. In addition, locomotives exempt under PR 3501 due to the installation of anti-idling devices that are set at 15 minutes are also exempt under PR 3502.

AFFECTED FACILITIES AND INDUSTRIES

PR 3501 and PR 3502 would affect two Class I freight railroads and one switching and terminal railroad in the district. Class I railroads are freight railroads that primarily transport freight rather than passengers and have operating revenue in excess of \$277.7 million in 2004. The cutoff for Class I railroads varies by year and is inflation adjusted. The two Class I freight railroads belong to industry of rail transportation [North American Industrial Classification System (NAICS) 482110]. The one switching and terminal railroad belongs to the sector of support activities for rail transportation (NAICS 488210). Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) are Class I freight railroads and Pacific Harbor Lines (PHL) is a switching and terminal railroad. All three affected corporations have locomotives operating within the district. Los Angeles Junction Railway is a switching and terminal railroad, wholly owned by the BNSF, and therefore, was considered as part of BNSF for this analysis.

AFFECTED LOCOMOTIVES

PR 3501 and PR 3502 would affect both intra-and inter-district locomotives. Based on the railroads' reports, it is estimated that the railroads operate a fleet of 2,280 locomotives in the district and approximately 50 percent of these locomotive are already equipped with anti-idling devices. According to the PR 3501 staff report, UP and BNSF operate approximately a combined 245 locomotives exclusively in the district. All of the 18 PHL locomotives are intra-

district locomotives since they operate solely within the boundaries of the district. Based on the rule staff assessment, there are 950 inter-district locomotives without anti-idling devices that belong to BNSF and UP. To conduct a cost analysis of PR 3501 and PR 3502, staff has used the universe of 190 intra-district and 950 inter-district locomotives without anti-idling devices for a total of 1,140 locomotives. The following provides a discussion of the basis of these estimates.

Intra-district Locomotives

To estimate the number of intra-district locomotives that are equipped and are not equipped with anti-idling devices, the District staff used the ratio of intrastate locomotives that are equipped and are not equipped with anti-idling devices and applied the ratio to the total number of intra-district locomotives. Based on the data submitted to the California Air Resources Board (CARB) by railroads, UP and BNSF had 238 and 176 intrastate locomotives in the state of California, respectively. Based on this data, UP had 116 diesel locomotives with anti-idling and 122 locomotives without anti-idling device. BNSF had four LNG locomotives, nine locomotives with anti-idling devices and 163 without anti-idling devices. Based on the intrastate ratio of locomotives equipped and not equipped with anti-idling devices, of the 245 total intra-district locomotives, there are about 190 intra-district locomotives currently operating without anti-idling devices. Out of the 190 locomotives without anti-idling devices, 97 belong to BNSF, 73 belong to UP, and the remaining 18 belong to PHL, respectively.

Inter-district Locomotives

The total number of locomotives operated by BNSF and UP nationwide in 2004 was estimated at 5,865 and 7,706, respectively.¹ Based on the total tons of freight originated in the U.S. and the total tons of freight carried in California, as estimated by the Association of American Railroads (AAR),^{2,3} the total number of interstate locomotives operating in California was estimated at 949 and 1,242 locomotives for BNSF and UP, respectively. Based on the information from the U.S. Department of Transportation,⁴ District staff estimates that approximately 87 percent of containers through California ports are handled by the Ports of Los Angeles and Long Beach. Thus, of the 2,191 interstate locomotives approximately 87 percent or 1,906 locomotives are estimated to be inter-district locomotives. Based on the data submitted by BNSF and UP to the CARB regarding locomotive fleets, 50 percent of the interstate locomotive fleet currently meets

¹Kerr, James W., "The Official Locomotive Rosters and News," 2005 Edition, DPA-LTA Publishers, November 2004.

² Association of American Railroads, "Railroad Industry Information: Railroad Profiles 2003," <http://aar.org/AboutTheIndustry/RailroadProfiles.asp>

³ Association of American Railroads, "Rail Service in California – 2003,"

[http://www.aar.org/PubCommon/Documents/about theIndustry/RRState_CAPdf?states=RRState-CA.pdf](http://www.aar.org/PubCommon/Documents/about%20theIndustry/RRState_CAPdf?states=RRState-CA.pdf)

⁴ Number of District locomotives is 86.7% of statewide total, based on "Top 30 Containership Ports: 2002," U.S. Department of Transportation, Bureau of Transportation Statistics, <http://www.bts.gov/publications/stat-transportation-profiles/summary/excel/table-03-11.xls>

- The top 30 encompasses 13,729 thousand twenty foot equivalent units (TEUs), or 99.3%, U.S. containership ports.
- California ports in the top 30 are Los Angeles (4,060,000 TEUs), Long Beach (3,184,000 TEUs), and Oakland (979,000 TEUs).
- Assuming that the 0.7% of containership ports (137,000 TEUs) not in the top 30 are in California, the Districts calculated share of freight carried statewide is approximately 87% (=7,244 TEUs/8,360 TEUs).

the U.S. Tier II standard or higher and thus is assumed to be equipped with anti-idling devices. Therefore, approximately 50 percent or 950 locomotives are inter-district locomotives that are not equipped with anti-idling devices.

Table 1: Locomotive Counts in the District

Locomotive Fleet	Estimated Number of Locomotives Not Equipped with Anti-Idling Devices
Intra-district Locomotive	190
Inter-district Locomotive	950
Total	1,140

PR 3501 COMPLIANCE COST

Under Proposed Rule 3501, affected railroads are required to maintain records and submit weekly and annual reports of idling events. Under the proposed rule, there are two types of exemptions. An individual locomotive can be exempt from the recordkeeping and weekly reporting requirements if that individual locomotive is equipped with an anti-idling device or is using an alternative technology, or if the railroad submits an Alternative Compliance Plan for either their intra- and/or inter-district fleet of locomotives. Upon approval of the Alternative Compliance Plan the entire fleet that is included in the alternative compliance plan would be exempt from recordkeeping and reporting of weekly idling events.

Locomotives Subject to PR 3501 Requirements

According to the 1998 CARB Memorandum of Understanding (MOU) with the railroads (CARB, 1998), non-switcher locomotives would meet the U.S. EPA Tier II average by 2010.⁵ Based on discussions with railroad representatives, it is assumed that Tier II locomotives would have anti-idling devices ~~installed~~retrofitted. Since some of the affected 1,140 locomotives are switchers, it is further assumed that 95 percent of 1,140 locomotives (1,083) would have anti-idling devices built in by 2010.

Currently, there are four switcher locomotives using the liquefied natural gas (LNG) technology and 10 switcher locomotives using the battery-hybrid switch (green goat) technology. Green goat locomotives are diesel-electric and use a large bank of on-board batteries to provide maximum power for short time periods. A small diesel engine (300 horsepower or less) is used to recharge the battery pack at a slower rate but, once the battery pack is charged, the diesel engine is automatically shut off. Therefore, these locomotives are suited for normal low-power switch operations, but not for longer local short- or line-haul operations. Based on current orders, it is projected that another 10 green goat locomotives would be available in 2006. An additional 6 locomotives is projected to be available in 2010 based on the U.S. EPA Tier II requirements ~~clean air laws~~ and the projection of high fuel prices.⁶ The LNG and green goat locomotives will be exempt from the data entry/weekly reporting requirements. It should be

⁵ For this analysis, Sswitcher locomotives are synonymous with intra-district locomotives and line-haul locomotives are synonymous with inter-district locomotives.

⁶ "Increasingly Popular Green Goats Keep Railpower out of the Red," Trains, October 2005.

noted that PR 3501 does not require the use of anti-idling devices or alternative technologies; therefore, their costs are not included in the PR 3501 compliance cost.

Table 2 shows the makeup of locomotives subject to the data entry/weekly reporting requirements by year. It is assumed that the makeup will stay at the 2010 level after the year 2010. As more locomotives are equipped with idling devices or alternative technology over time, the number of locomotives subject to the PR 3501 requirements will decline.

Table 2: Cumulative Locomotive Counts by Compliance Option by Year

Compliance Options	2005	2006	2007	2008	2009	2010
Anti-idling Devices	0	228	456	684	912	1083
Green Goat	10	20	20	20	20	26
LNG	4	4	4	4	4	4
Data Entry/Weekly Reporting	1126	888	660	432	204	27
Total	1140	1140	1140	1140	1140	1140

It should be noted that the total number of locomotives is 2,280. Table 2 shows the 1,140 locomotives that will be subject to the weekly recordkeeping requirements. All 2,280 locomotives are subject to the annual report.

Training Cost

Implementation of PR 3501 is expected to result in a cost impact from training personnel associated with reducing unnecessary idling. There are a total of approximately 9,000 freight employees in California. It is assumed that 1,000 of them would have to be trained. Staff has estimated that training for Proposed Rules 3501 and 3502 could be ½ day per employee and 50 employees per training class, with a training cost of \$400 per day for a trainer. The preparation cost for the trainer, including distribution materials for employees, is \$400. Since the training for PR 3501 is the same as for PR 3502, only half of the training cost herein should be allocated to PR 3501. The one-time training cost for PR 3501 is \$2,200 $\{ = [\$400 + \$400 * (1,000/50/2)]/2 \}$.

Recordkeeping Cost

It is assumed that each locomotive subject to the PR 3501 requirements, on average, would have two to six idling events daily. Additional explanation/analysis is required for an idling event over two hours. The Roseville study conducted by the CARB indicated that the number of idling events exceeding two hours is limited. Even though each event would take a conductor/engineer to record, it is assumed that recording and/or explanation for idling events can be achieved within daily workload as these activities would occur during their current operations. Therefore, no additional cost is associated with recording idling events.

The recordkeeping cost is comprised of the cost of system setup, data entry/weekly reporting, and annual reporting. The one-time system setup cost for the reporting purpose is estimated at \$40 an hour for a total of estimated 500 hours at each railroad company. The 500 hours are comprised of the following: 100 hours for initial development, 100 hours for internal review, 100 hours for testing, 100 hours for debugging, and the remaining 100 hours for implementation. The total system set up cost for the three railroads would be \$60,000 $(= \$20,000 * 3)$.

The data entry/weekly reporting for each locomotive is assumed to be 10 minutes per week at \$40 per hour. The cost would vary by year due to different numbers of affected locomotives each year (Table 2). The average annual cost from 2006 to 2010 is estimated to be \$153,296.

Annual reporting is required of all locomotives regardless of whether they have anti-idling devices or use an alternative technology. A total of 2,280 locomotives will be subject to this requirement annually. Based on the staff observations, it is assumed it would take 10 minutes per year per locomotive at a rate of \$40 per hour for annual reporting. The annual reporting cost is estimated to be \$15,200 per year. Annual reporting beyond the first year is for updating only. Therefore, the annual reporting cost for subsequent years should be less.

The total average annual recordkeeping cost would be \$180,496. The total average annual cost of PR 3501 from 2006 to 2010, including the training cost, is projected to be \$180,936. Since the makeup of affected locomotives subject to the data entry/weekly reporting requirements beyond 2010 is assumed at the 2010 level, the total annual cost of PR 3501 for 2010 and onwards would be the same. The railroads' reporting cost to the AQMD via e-mail or fax is expected to be minimal. Because PR 3501 does not significantly affect air quality or emission reductions, no socioeconomic impact assessment is legally required.

PR 3502 COMPLIANCE COST

Proposed Rule 3502 establishes specific situations in which a locomotive cannot idle for more than 30 minutes such as if the locomotive is unoccupied or if there is a delay for more than 30 minutes. Under Proposed Rule 3502, if a locomotive is equipped with an anti-idling device that is set at 15 minutes and engaged, the locomotive would be exempt from the idling requirements since the use of the anti-idling device would achieve similar or greater emission reductions than the compliance with idling restrictions. In addition, under PR 3502, a railroad has the option of submitting an Emissions Equivalency Plan. The Emissions Equivalency Plan must specify a control approach that would reduce NOx and PM emissions at least as much as if the locomotives complied with idling restrictions.

Implementation of PR 3502 is expected to result in a cost impact from training personnel and a potential savings associated with reducing unnecessary idling. The net impact of PR 3502 is an average annual savings of \$3,219,550 from 2006 to 2010.

Emission Reductions and Cost Effectiveness

PR 3502 would result in approximately 12 to 22 tons of PM and 261 to 493 tons of NOx reduced per year (depending on the inventory methodology), based on the staff report for PR 3502. Since PR 3502, overall, would result in savings, the cost-effectiveness values were not calculated.

Training Cost

There are a total of approximately 9,000 freight employees in California. It is assumed that 1,000 of them would have to be trained. Staff has estimated that training for Proposed Rules

3501 and 3502 could be ½ day per employee and 50 employees per training class, with a training cost of \$400 per day for a trainer. The preparation cost for the trainer, including distribution materials for employees is \$400. Since the training for PR 3501 is the same as for PR 3502, only half of the training cost herein should be allocated to PR 3502. The one-time training cost for PR 3502 is \$2,200 $\{= [\$400 + \$400 * (1,000/50/2)]/2\}$.

Fuel Savings

Avoiding unnecessary idling would result in potential fuel savings. It is assumed that a 30-minute idling event per locomotive would save five gallons per hour of diesel fuel at the \$1.5 per gallon (bulk rate).⁷ Locomotives that are not equipped with anti-idling devices or use an alternative technology would benefit from turning off engines, as shown in Table 2. It is assumed switchers would have two idling events a day and line-haul locomotives would have six idling events a day. Based on the Roseville Study (CARB, 2004), trains routed through the Subway had ~~were assumed to undergo~~ one idling event of 120 minutes while awaiting departure. Trains in the Service Tracks had idling events of 120 minutes, consisting of one event in the Ready Track area and one while awaiting departure. Applying the results from the analysis of the Roseville study to the proposed rule, there would be approximately two idling events per day of greater than 30 minutes $[(9,600 / 31,000) * 1] + [(21,400 / 31,000) * 2] = 1.69$. The six idling events per day for the line-haul locomotives would include four events for crew changes (out of a total of six per day, including breaks) and two events for awaiting departure, as discussed above.

According to the Rule Staff Reports for PR 3501 and PR 3502, 83 percent of the locomotives subject to the PR 3501 data entry/weekly reporting requirements are inter-district and the remaining are intra-district locomotives. The total fuel savings attributable to the proposed rule from the affected locomotives will decline over time as more locomotives are equipped with idling devices under the 1998 MOU or use an alternative technology. It is projected that the average annual fuel savings due to turning off engines (not from anti-idling devices or alternative technology) from 2006 to 2010 for both types of locomotives is \$3,219,990. The annual fuel savings is based on six events per day at 30 minutes per idling event for line-haul and two events per day at 30 minutes per idling event for switcher locomotives. The idling rate was assumed at five gallons per hour per locomotive and the diesel fuel cost was assumed at \$1.50 per gallon.

Although PR 3502 does not require the installation of anti-idling devices and/or the use an alternative technology, the costs of anti-idling devices and/or alternative technology are presented herein for references only.

Costs of Anti-idling Devices and Alternative Technology

According to ZTR systems (Personal Communication, November 2005), the capital cost of an anti-idling device is estimated to be \$12,000.⁸ However, the cost could go as high as \$30,000 (U.S. EPA, 2005). According to ZTR systems, the cost of installing an anti-idling device could

⁷ Tables 17, 40, and 41, Petroleum Marketing Monthly, December 2005.

⁸ Personal Communication with Peter Trencle. ZTR Systems is a manufacturer of anti-idling device.

be up to \$5,000 and its associated annual operating and maintenance cost is estimated at up to \$1,000 per year.

Based on railroad industry experts, railroads would install an anti-idling device during regular maintenance of a locomotive. Locomotives may be shut down for an additional three days beyond their regular maintenance schedules. According to ZTR systems, the opportunity cost of not operating a locomotive is estimated at \$2,000 per hour.

Lastly, installation of anti-idling devices will ~~could~~ result in substantial fuel savings per year. Installation of anti-idling device could save as much as 20,000 gallons (U.S. EPA, 2005) of fuel for each locomotive per year. Based on the diesel fuel cost of \$1.50 per gallon, the total annual fuel savings of 190 intra- and 950 inter-district locomotives could be \$34.2 million. As a result, the use of anti-idling device for rule compliance over all will result in savings, and therefore, the cost-effective analysis was not conducted.

According to Rail Power Technologies Corporation (Personal Communication, March 2005) and Cleaire Advanced Emission Controls LLC (Personal Communication, March 2005), the capital cost of a green goat locomotive is approximately \$785,000 and is expected to last 25 years.⁹ In addition, the battery pack must be replaced every eight years, on average, for an estimated cost of \$132,000, based on District staff assumptions. The annual fuel savings is expected to be \$64,000 per year for each locomotive.

According to Motive Power (Personal Communication, March 2004), the capital cost of a LNG locomotive is approximately \$1.5 million and is expected to last 25 years.¹⁰ District staff assumes that an LNG locomotive would use more fuel than a diesel locomotive (85,000 versus 50,000 gallons per year). The additional cost of fuel usage is estimated at \$16,000 per year per locomotive.

Due to the high capital cost, the use of LNG locomotives would result in significant cost impact. The use of green goat technology would overall result in savings (much smaller than using anti-idling device). In addition, these alternative technologies are suited for normal low-power switch operations, not for longer local short- or line-haul operations. As such, the use of these technologies to comply with the proposed rule is unlikely.

SMALL BUSINESS IMPACTS OF PR 3501 AND PR 3502

The AQMD defines a "small business" in Rule 102 as one which employs 10 or fewer persons and which earns less than \$500,000 in gross annual receipts. In addition to the AQMD's definition of a small business, the federal Small Business Administration (SBA), the federal Clean Air Act Amendments (CAAA) of 1990, and the California Department of Health Services (DHS) also provide their own definitions of a small business.

⁹ Personal Communication with Gary Eelman of Rail Power Technologies Corporation and Brad Edgar of Cleaire Advanced Emission Controls LLC.

¹⁰ Personal Communication with Dennis Nott.

The SBA's definition of a small business uses the criterion of either gross annual receipts (ranging from \$0.5 million to \$17 million, depending on industry type) or number of employees (ranging from 100 to 1,500). The SBA definitions of small businesses vary by 6-digit NAICS code. The facilities affected by PR 3501 and PR 3502 belong to the industries of rail transportation (NAICS 482110) and support activities for rail transportation (NAICS 488210). Fewer than 1500 employees is the criterion below which a business is considered small for the industry of rail transportation and a gross revenue of \$6 million is the criterion below which a business is considered small for the sector of support activities for rail transportation.

The CAAA classifies a facility as a "small business stationary source" if it: (1) employs 100 or fewer employees, (2) does not emit more than ten tons per year of either VOC or NOx, and (3) is a small business as defined by SBA. The DHS definition of a small business uses an annual gross receipt criterion (ranging from \$1 million to \$9.5 million, depending on industry type) for non-manufacturing industries and an employment criterion of fewer than 250 employees for manufacturing industries.

PR 3501 and PR 3502 would affect two Class I freight railroads and one switching and terminal railroad in the district. The BNSF and UP are Class I freight railroads and PHL is a switching and terminal railroad. Based on the latest (July 2005) financial reports, UP had 48,000 employees with a gross revenue of \$12.2 billion and BNSF had 38,000 employees with a gross revenue of \$10.9 billion, respectively, in 2004. PHL had 145 employees with a gross revenue of \$38 million in 2004. Based on the above small business definitions, none of the affected facilities would be considered a small business.

TOTAL IMPACT OF PR 3501 AND PR 3502

The implementation of PR 3501 and 3502 is projected to result in an average annual net savings of \$3,039,054 from 2006 to 2010, as shown in Table 3. In order to be conservative, a 10 percent contingency cost is built into the cost of PR 3501, resulting in an average annual cost of \$198,546. Adding a 10 percent contingency cost to training in PR 3502 would give rise to an average annual net savings of \$3,219,506 for PR 3502. The net savings from the combined two proposed rules with a 10 percent contingent cost built in would be \$3,039,010. The savings will give rise to a slightly positive job impact on the overall economy. Since there is no net cost resulting from the implementation of PR 3501 and PR 3502, an analysis of the impact of the proposed rules on employment in the local economy and other macroeconomic impacts through an economic model were not conducted.

Table 3: Cost/Savings of Proposed Rules by Year

Proposed Rule	2006	2007	2008	2009	2010	Average Annual (2006-2010)
3501	\$385,240	\$244,000	\$164,960	\$85,920	\$24,560	\$180,936
3502	-\$6,463,994	-\$4,805,955	-\$3,145,716	-\$1,485,477	-\$196,607	-\$3,219,550
Total Net Savings	-\$6,078,754	-\$4,561,955	-\$2,980,756	-\$1,399,557	-\$172,047	-\$3,039,054

RULE ADOPTION RELATIVE TO THE COST-EFFECTIVENESS SCHEDULE

On October 14, 1994, the Governing Board adopted a resolution that requires staff to address whether rules being proposed for adoption are considered in the order of cost-effectiveness. The 2003 Air Quality Management Plan (AQMP) ranked, in the order of cost-effectiveness, all the control measures for which costs were quantified. It is generally recommended that the most cost-effective measures be taken first. PR 3501 and 3502 are not part of 2003 AQMP control measures. As such, consideration in order of cost-effectiveness is not applicable.

The necessity of adopting the proposed rules in order to attain state and federal ambient air quality standards is delineated in the Rule Staff Reports for PR 3501 and PR 3502.

References

Association of American Railroads. "Railroad Industry Information: Railroad Profiles 2003." <http://aar.org/AboutTheIndustry/RailroadProfiles.asp>

Association of American Railroads. "Rail Service in California—2003." [http://www.aar.org/PubCommon/Documents/about theIndustry/RRState_CApdf?states=RRState-CA.pdf](http://www.aar.org/PubCommon/Documents/about%20theIndustry/RRState_CApdf?states=RRState-CA.pdf)

California Air Resources Board (CARB). "Roseville Rail Yard Study." 2004. Downloaded from <http://www.arb.ca.gov/diesel/document/rrstudy.htm>

California Air Resources Board (CARB). "Memorandum of Understanding with the Railroads." 1998.

"CSXT Pioneers Standby Locomotive Generator." Bull Sheet Monthly News. February 25, 2003. Downloaded from <http://www.bullsheet.com/news/200003.html>

"Keeping Track—Railroad Consulting and Training." Downloaded December 2005 [http://www.training.com/keeping track/contract.htm](http://www.training.com/keeping_track/contract.htm)

Kerr, James W. "The Official Locomotive Rosters and News." 2005 Edition. DPA-LTA Publishers, November 2004.

Lustig, David. "Increasingly Popular Green Goats Keep RailPower out of the Red." Trains. October 2005. Downloaded from <http://www.trains.com/Content/Dynamic/Articles/000/000/006/133hnebk.asp>

South Coast Air Quality Management District (SCAQMD). Proposed Rule 3501. December 2005.

South Coast Air Quality Management District (SCAQMD). Proposed Rule 3502. December 2005.

U.S. Environmental Protection Agency (U.S. EPA). "An Overview for Citizens and Solutions for Railroad Companies—Locomotive Switcher Idling and Idle Control Technology." June 2005.

U.S. Department of Transportation. Bureau of Transportation Statistics. "Top 30 Containership Ports: 2002." <http://www.bts.gov/publications/stat-transportation-profiles/summary/excel/table-03-11.xls>

U.S. Department of Energy. Petroleum Marketing Monthly. December 2005. Downloaded from http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_marketing_monthly/current/pdf/contacts.pdf#search='Energy%20Information%20Administration%2FPetroleum%20Marketing%20Monthly%20December%202005'

U.S. Small Business Administration. “Small Business Size Standards.” January 2004.